

A cross-sectional view of a semiconductor device 10 along the X-axis. The Z-axis is vertical, and the X-axis is horizontal. The origin 0 is at the center of the device. The device features a central trench 11. On the left side, there is a structure 12 on top of a layer 13, which is on top of a substrate 11. On the right side, there is a structure 16 on top of a layer 13b, which is on top of a substrate 11. The device includes four regions labeled R11, R12, R13, and R14, which are shaded with diagonal lines. The distance from the center to the right edge of the device is labeled D0. The distance from the center to the right edge of the trench is labeled D1. The distance from the center to the right edge of the structure 16 is labeled D2. The device is labeled 10.

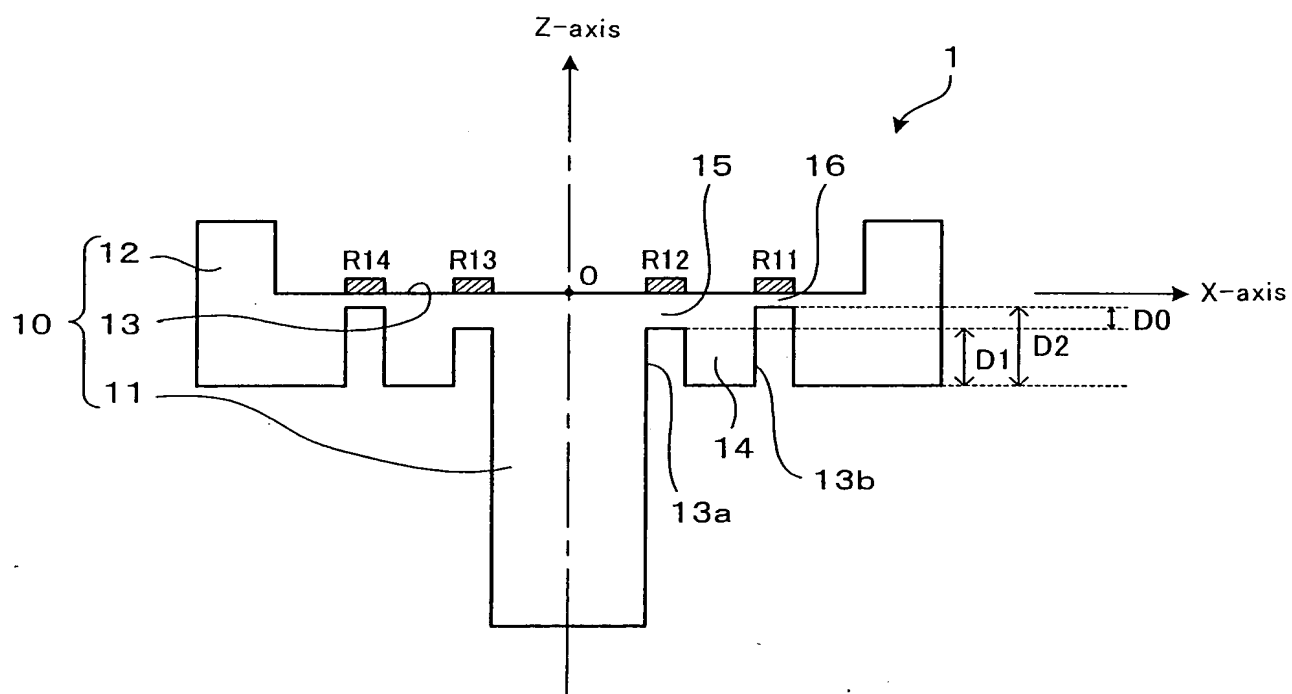


FIG. 2

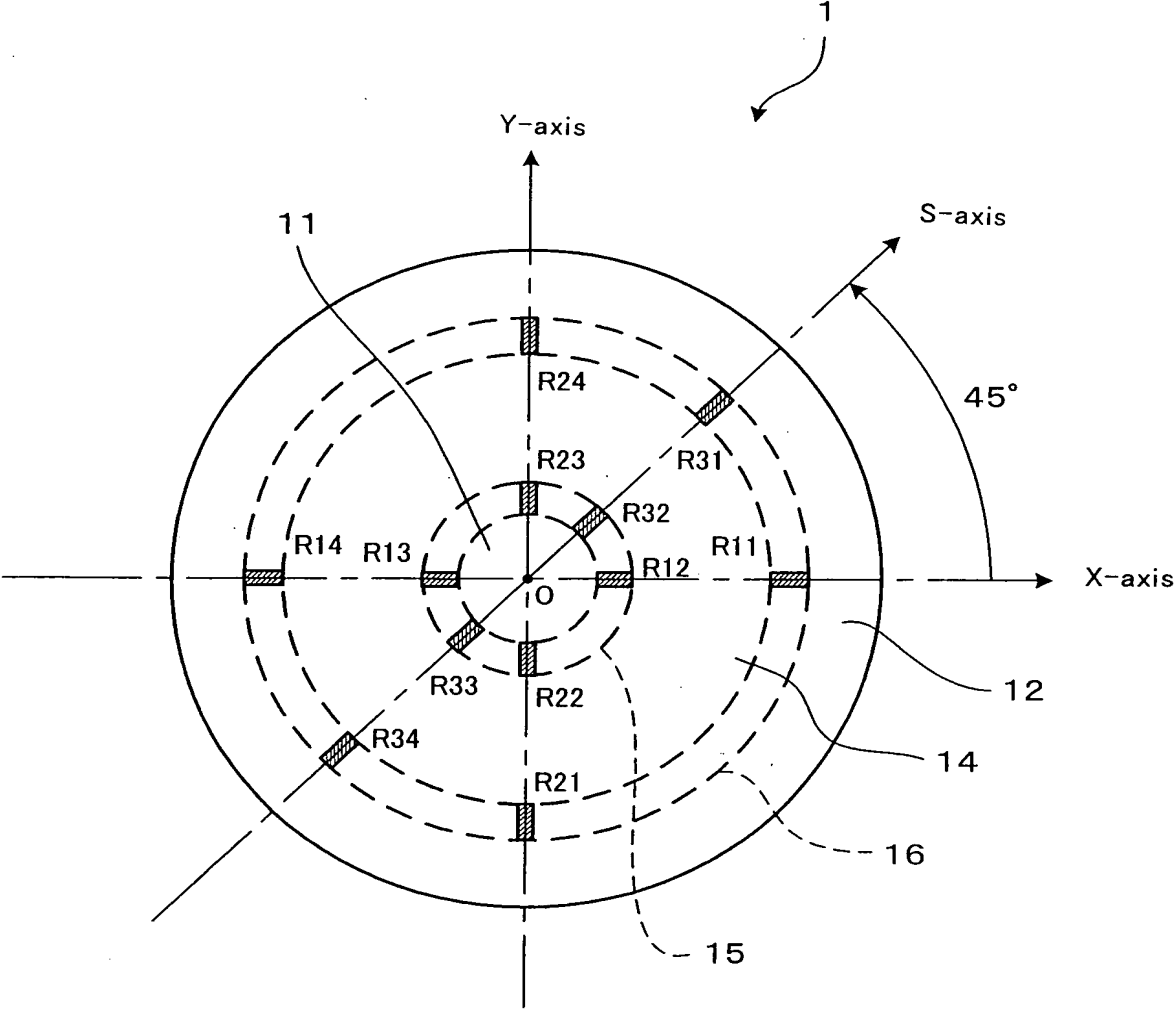


FIG. 3

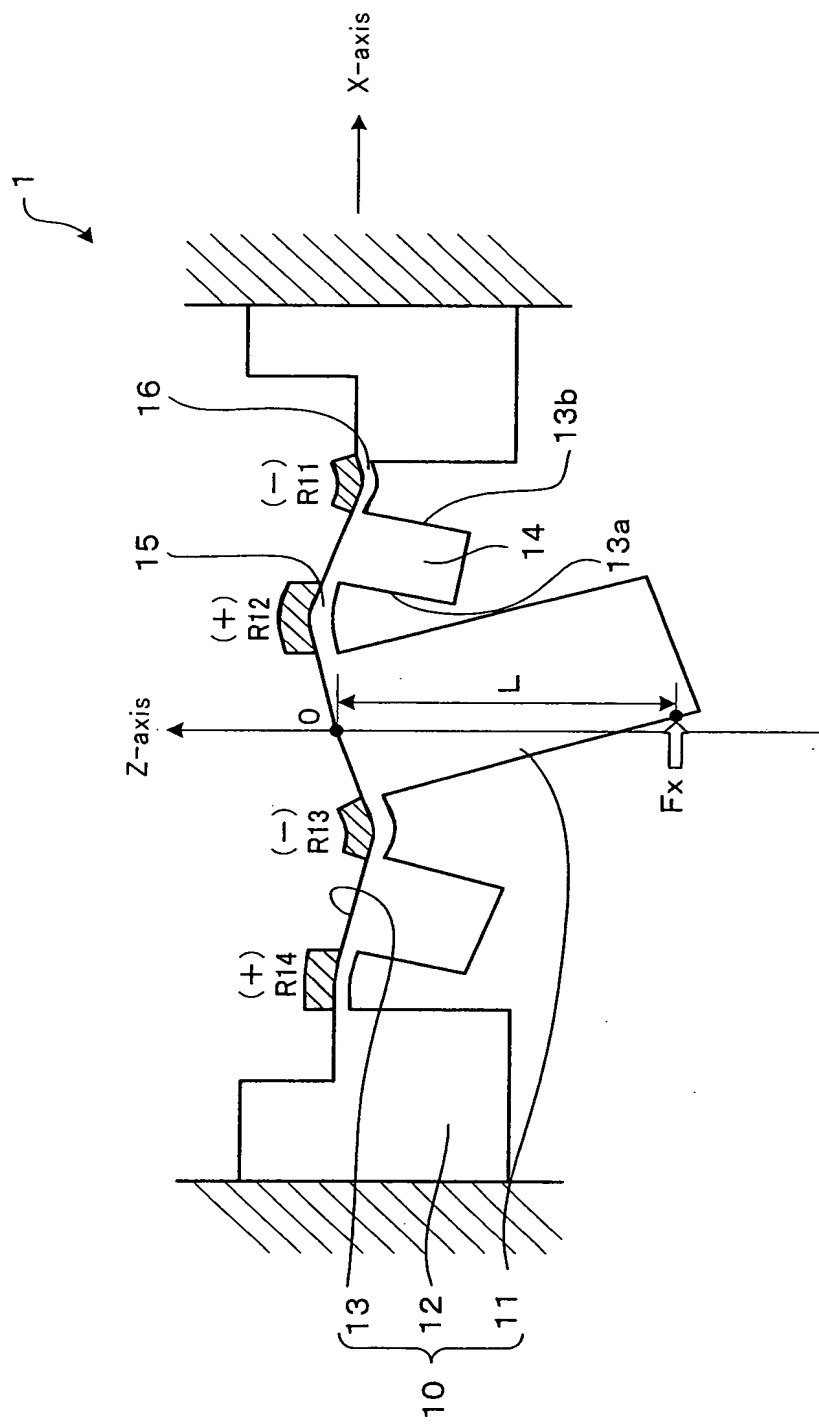


FIG. 4

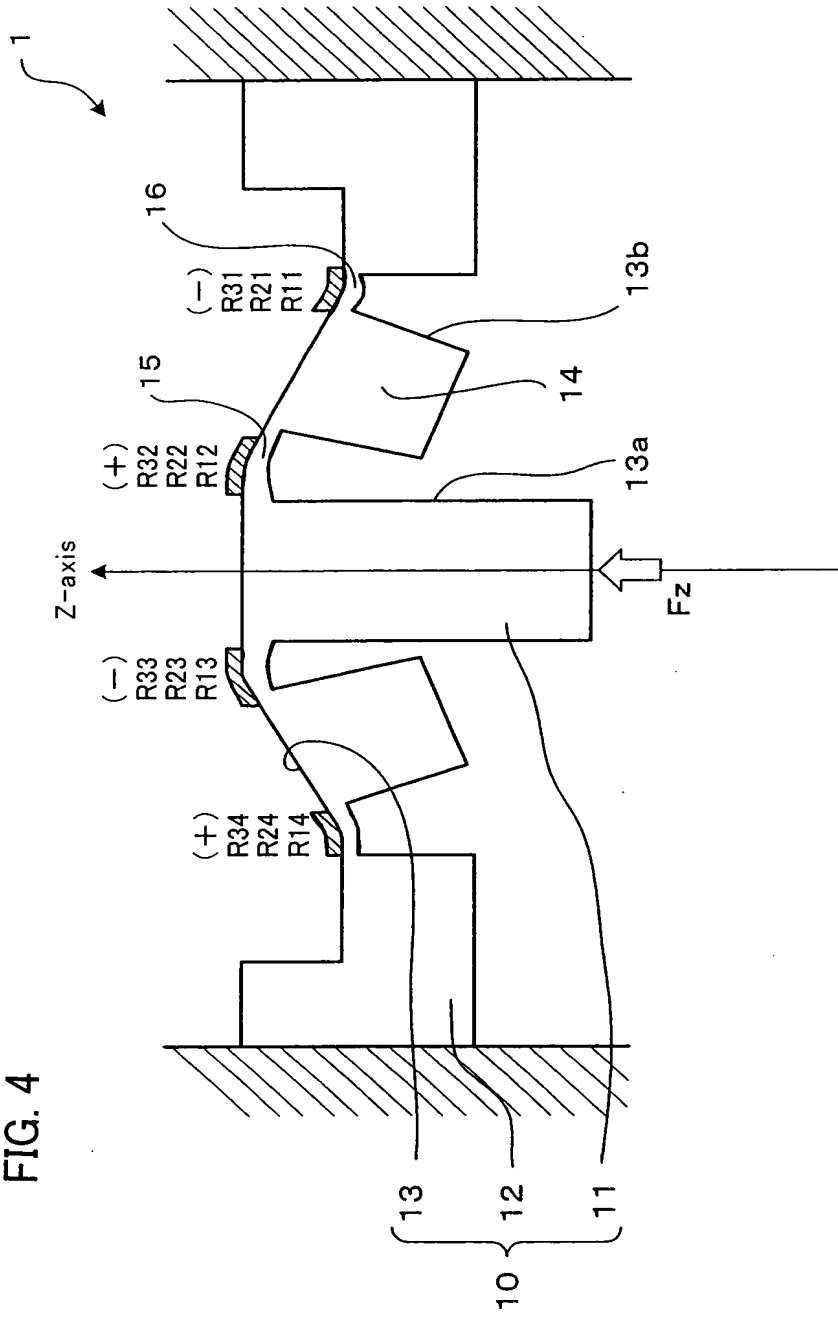


FIG. 5A

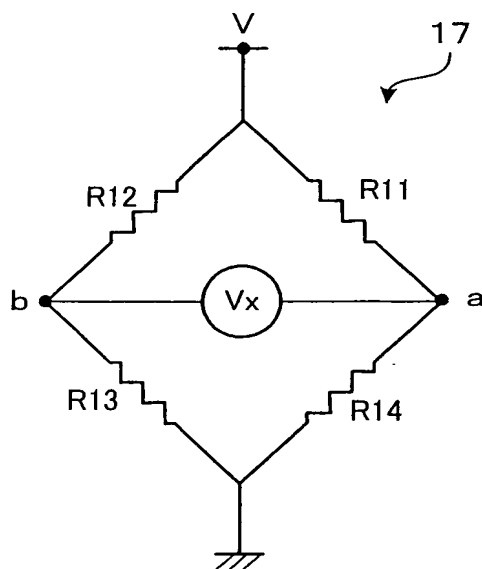


FIG. 5B

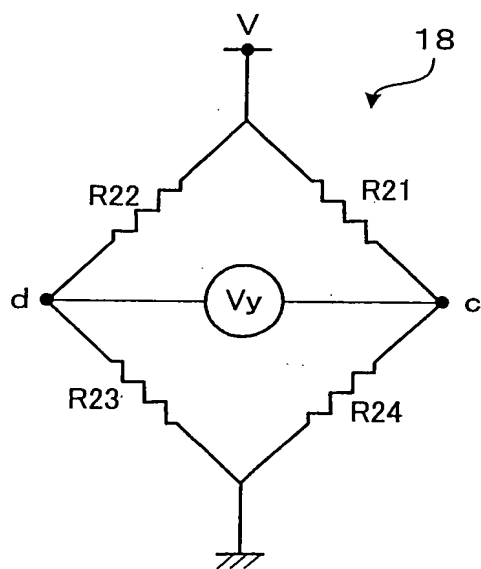


FIG. 5C

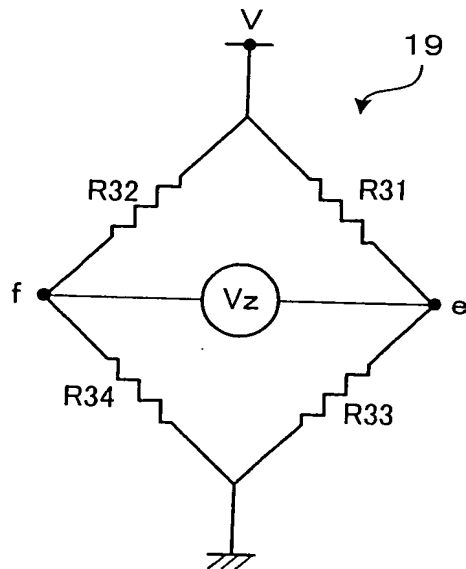


FIG. 6

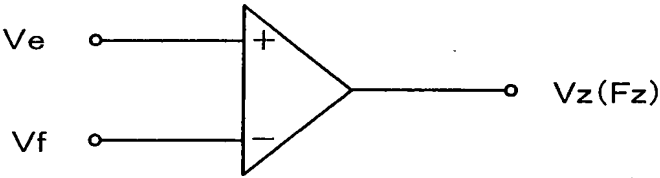
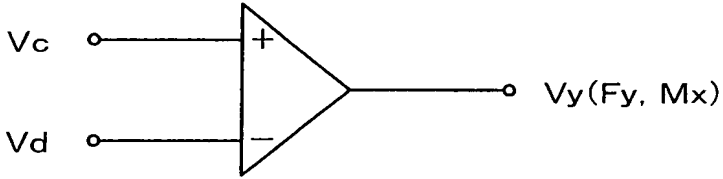
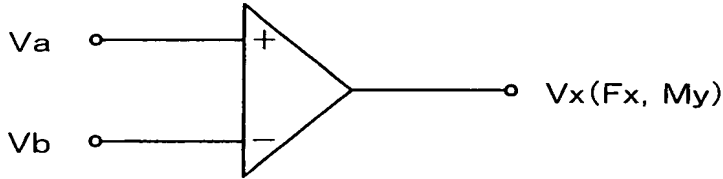


FIG. 7

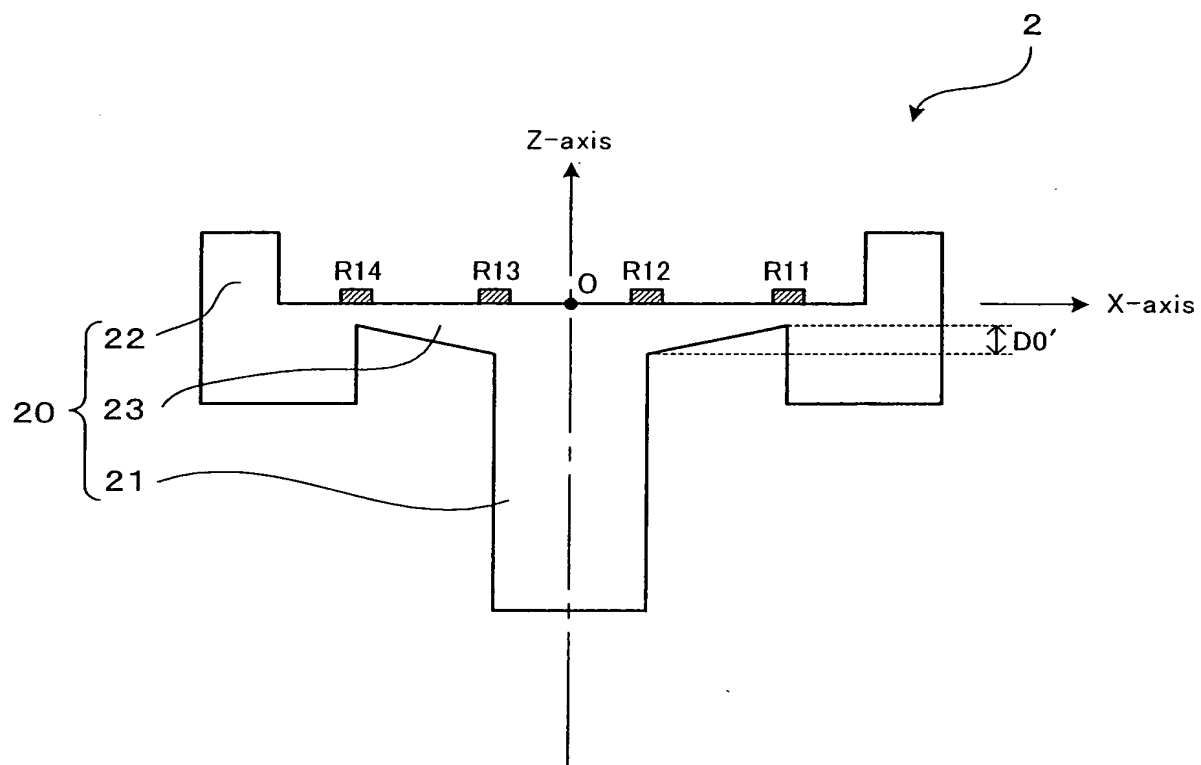




FIG. 8

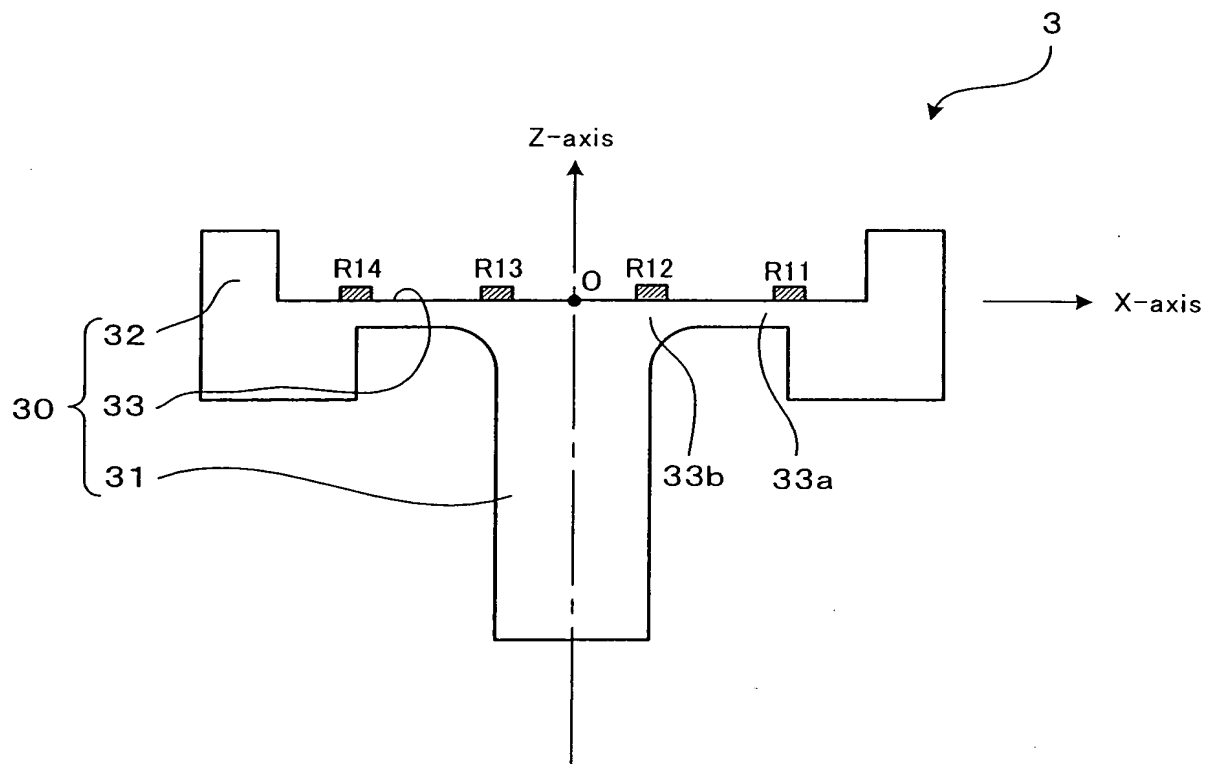


Diagram illustrating a cross-sectional view of a semiconductor device structure, showing a central Z-axis and various layers and regions.

The structure includes a central channel region (41) and side regions (42). A top layer (43) is shown, with a dashed line (44) indicating a vertical boundary. The Z-axis is indicated by an arrow pointing upwards, with the origin (0) marked at the center of the channel.

Regions and layers are labeled as follows:

- Regions:** R34, R24, R14, R33, R23, R13, R32, R22, R12, R31, R21, R11.
- Layers:** 45, 46.
- Dimensions:** L1, L2.
- Other labels:** 40, 43a, 43b, 44.

FIG. 10

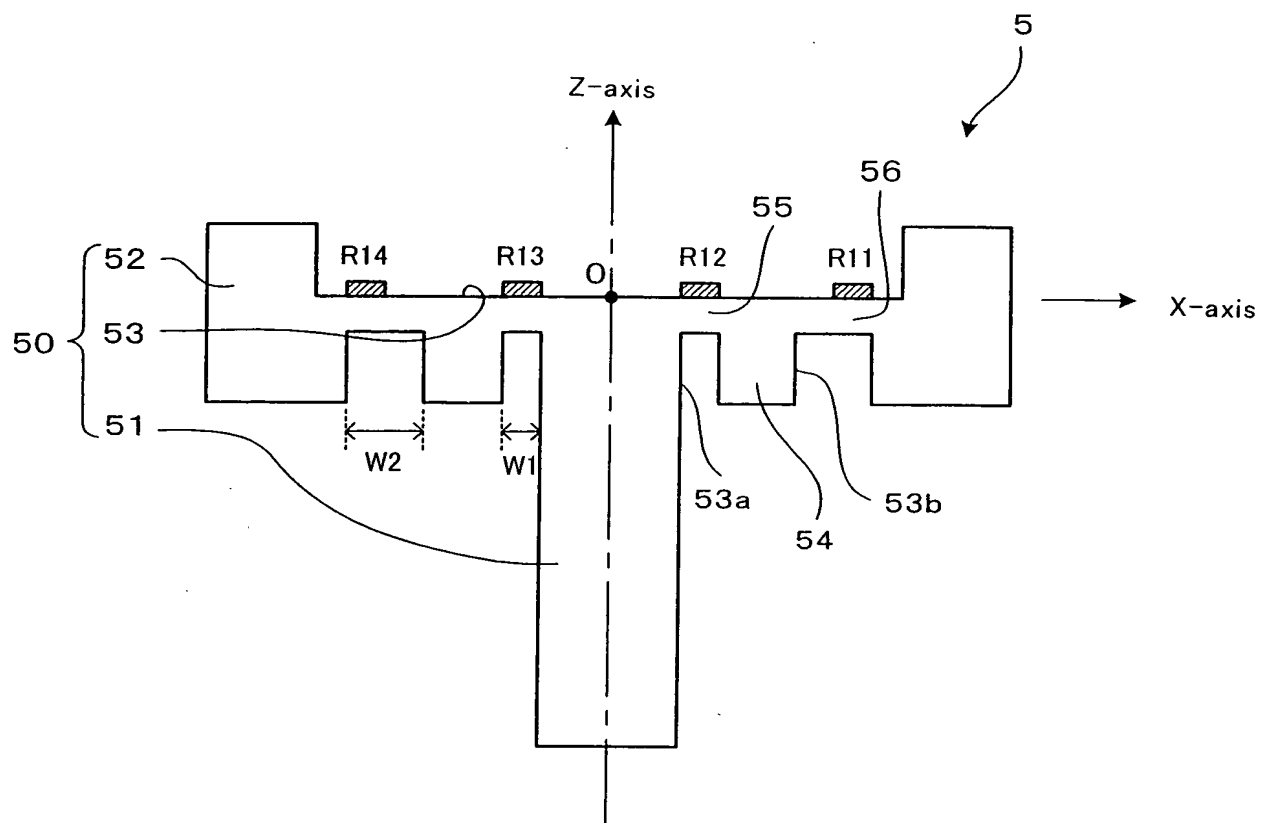


FIG. 11

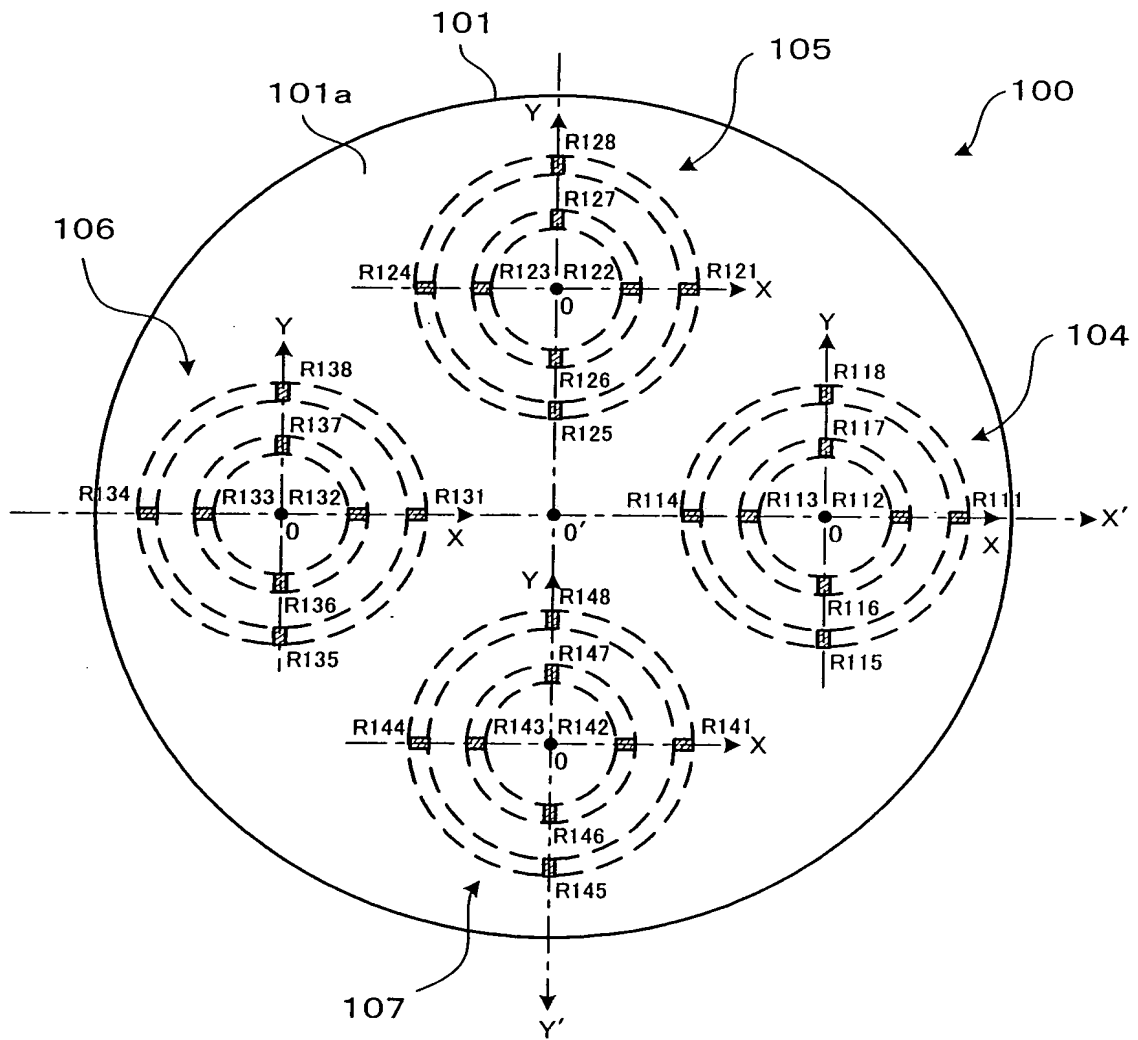


FIG. 12

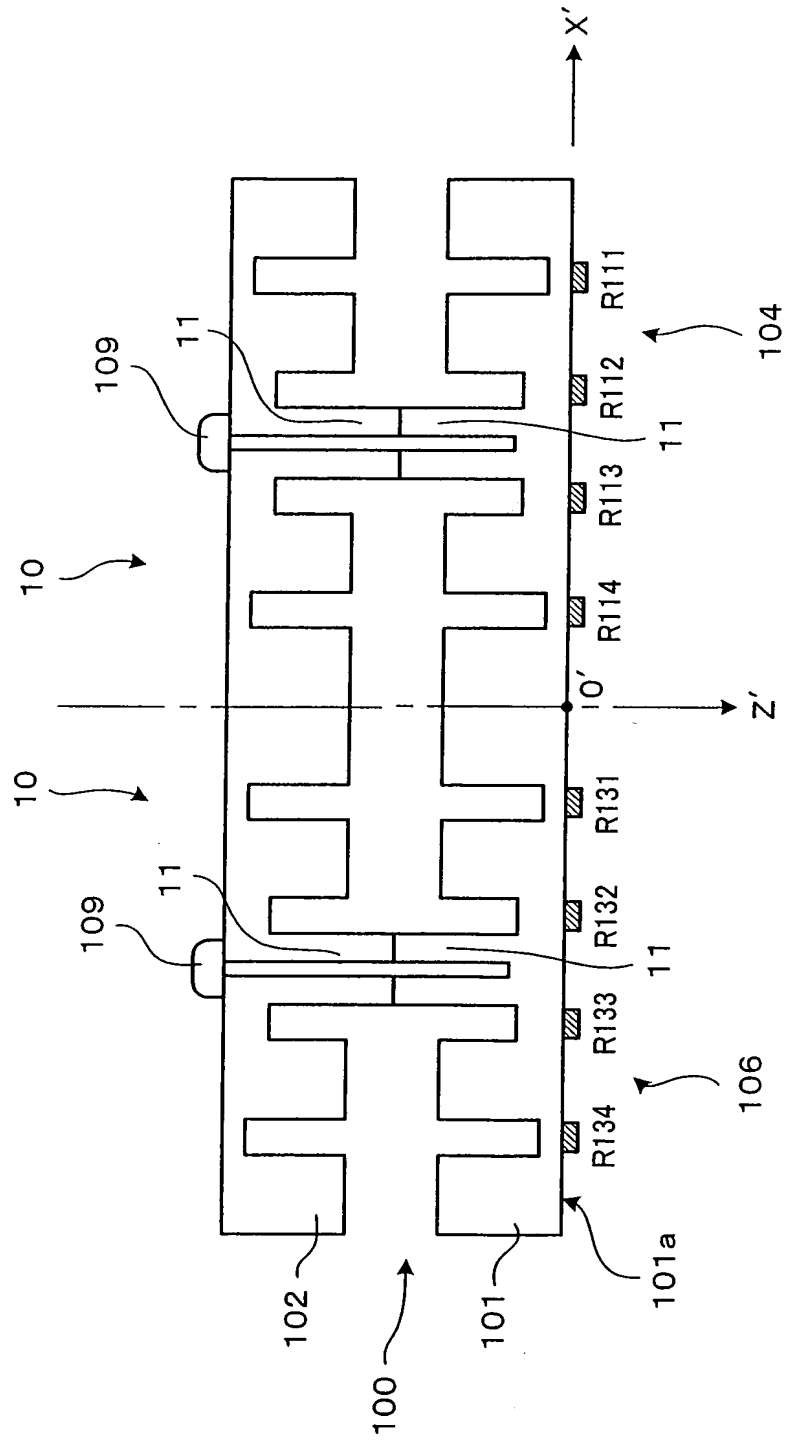


FIG. 13

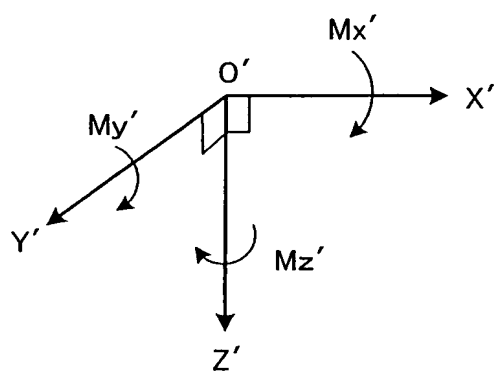


FIG. 14

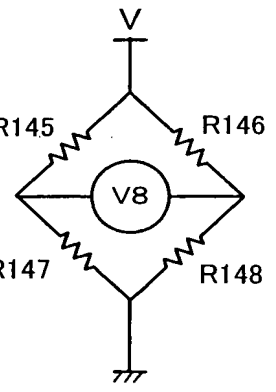
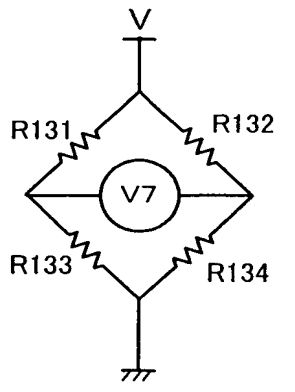
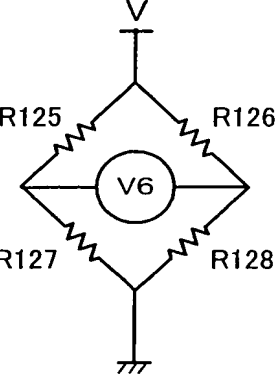
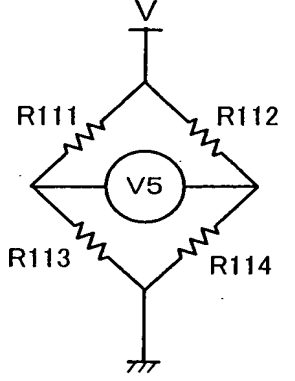
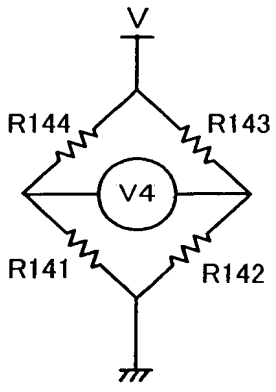
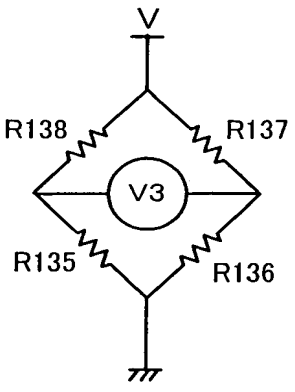
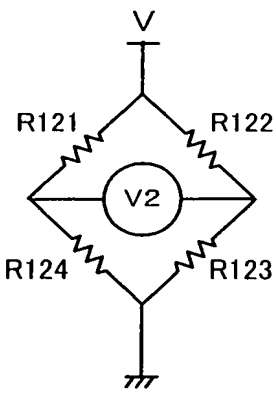
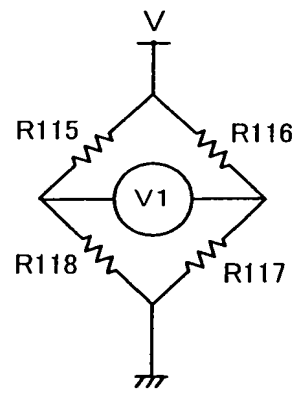


FIG. 15

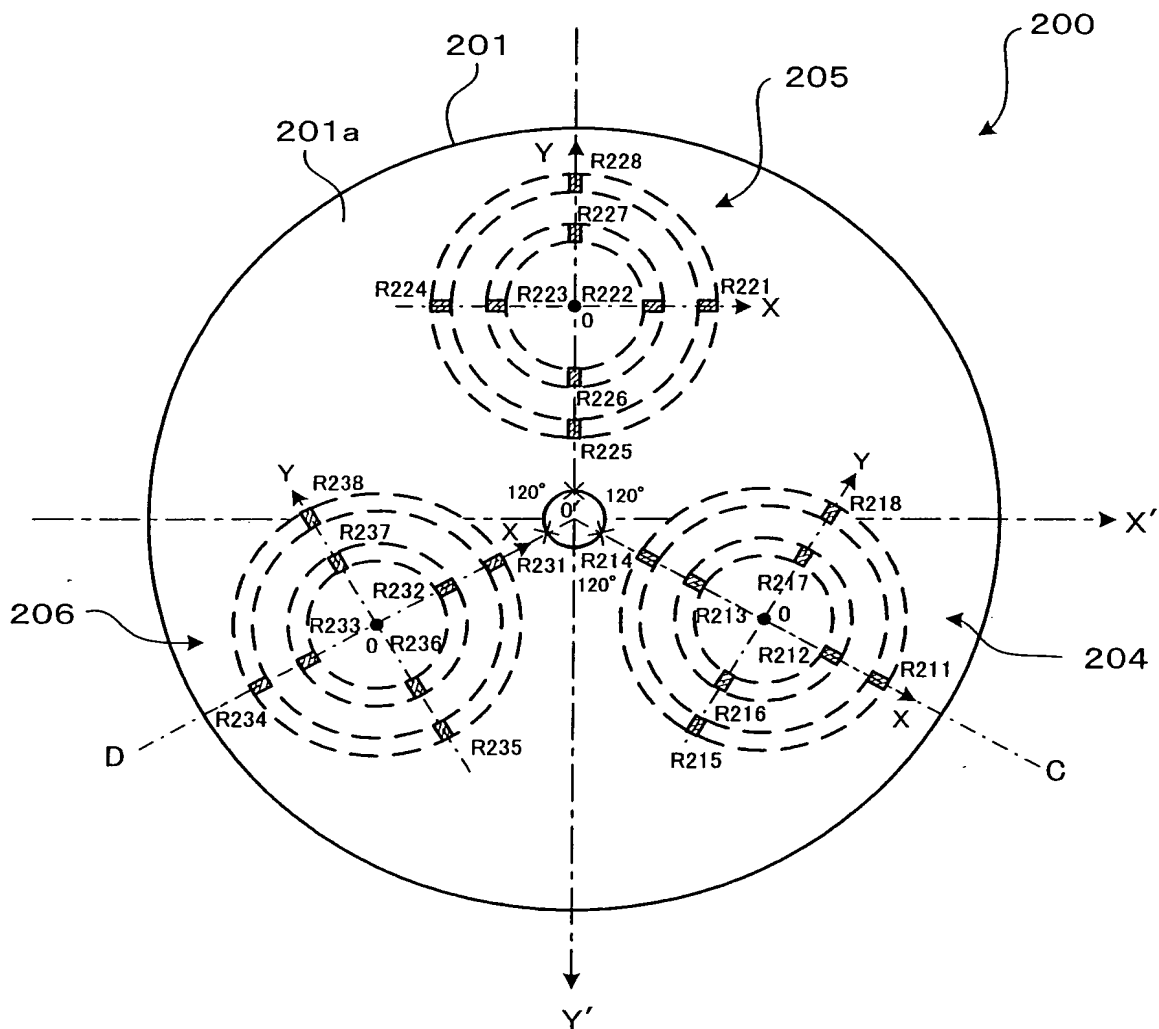




FIG. 16

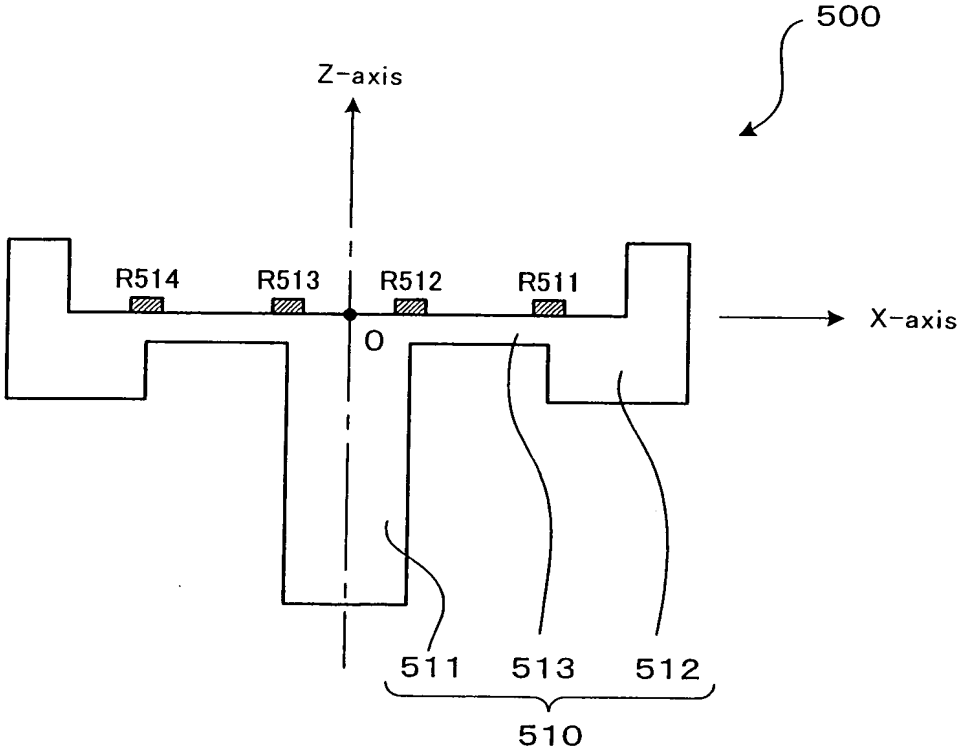


FIG. 17

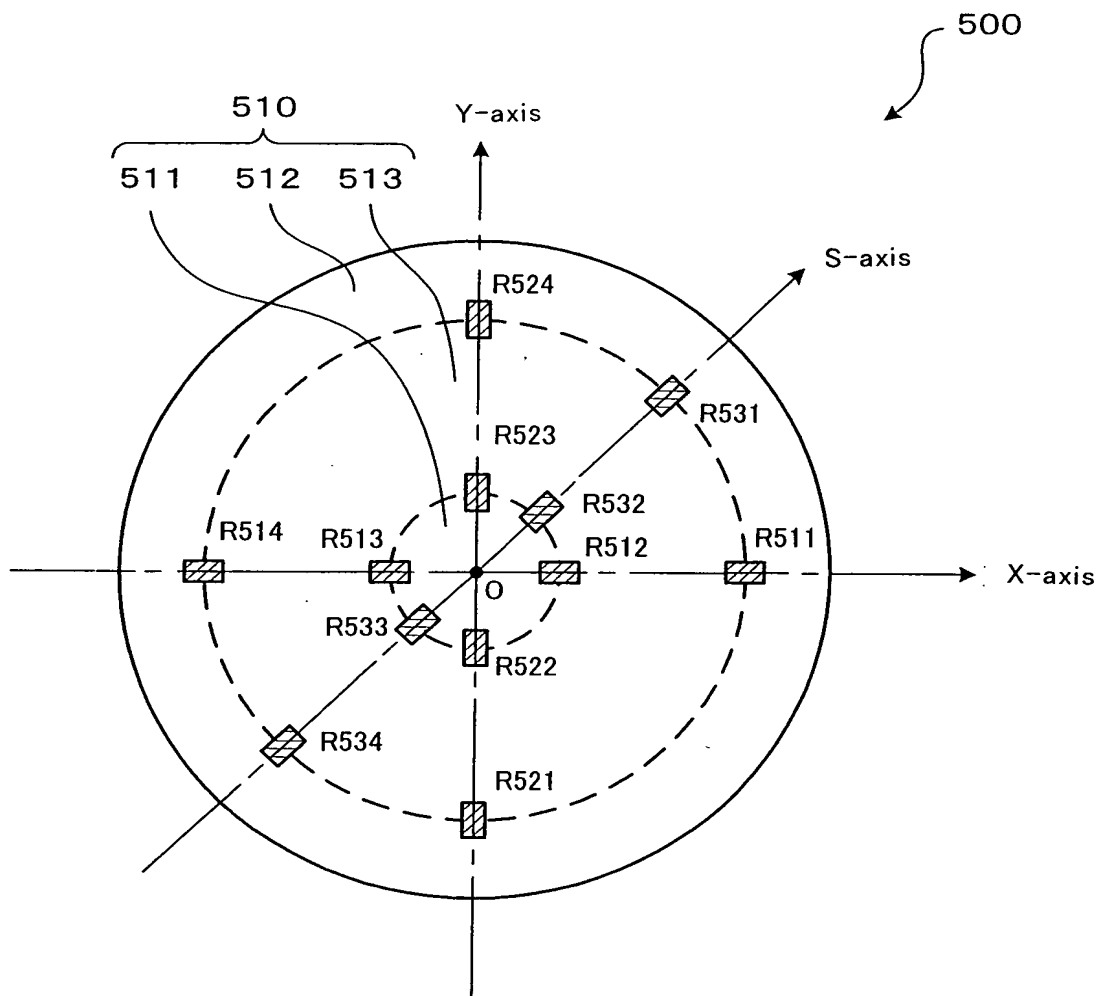


FIG. 18A

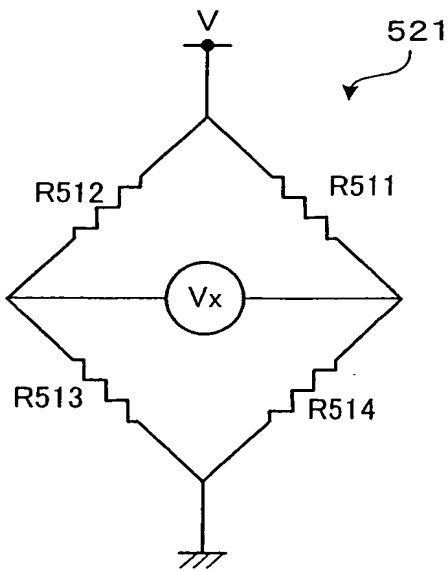


FIG. 18B

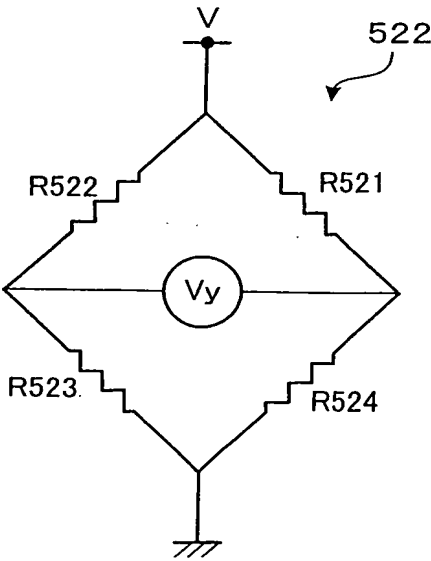


FIG. 18C

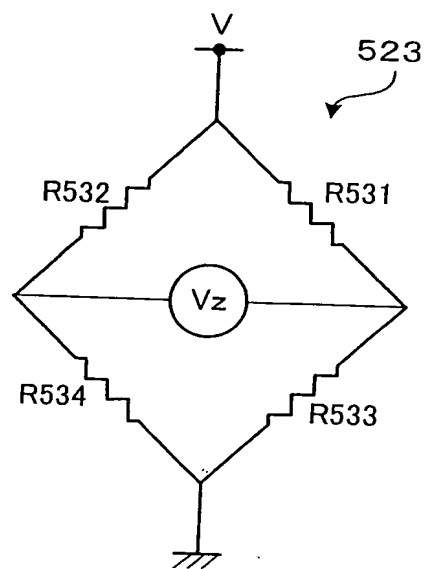


FIG. 19

